

The first record of phoretic mite *Sennertia cerambycina* (Acari, Chaetodactylidae) in Serbia

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Abstract

The phoretic mite *Sennertia cerambycina* (Scopoli, 1763) (Acari, Chaetodactylidae) has been documented for the first time within the territory of Serbia. Deutonymphs of this species were identified on a heavily infested female violet carpenter bee, *Xylocopa violacea* (Linnaeus, 1758) (Hymenoptera, Apidae). The infested bee was collected on November 11th, 2023, in Vrčin, near Belgrade.

Keywords

Apidae, Balkans, deutonymph, infestation, Hymenoptera.

The acarian family Chaetodactylidae comprises five genera whose representatives are characterized by an obligate association with various bee species. They possess prominent morphological, developmental, and biological adaptations to their specific lifestyle. Additionally, their ecological interactions with the host bees can be very diverse - they are well-known as symbionts in bee nests, parasitoids, or commensals (Klimov and O'Connor 2008). The genus *Sennertia* Oudemans, 1905 is the most diverse genus in its family, and the genus comprises four subgenera and 81 species, according to Doğan (2022) and Chao et al. (2023). Moreover, the subgenus *Sennertia* can be divided into six species-groups, of which only two, the *cerambycina*-group and *zhelochovtsevi*-group, occur in Europe. *Sennertia cerambycina* (Scopoli, 1763) is a parasite-commensal phoretic mite associated with *Xylocopa* (Hymenoptera: Apidae) bees. Vicedomini (1996) discovered that deutonymph infestation of *Xylocopa*

females by *S. cerambycina* can be as high as 74.1%, without significantly affecting mating and nesting performance. However, they also concluded that adult hosts can be damaged by the presence of phoretic stage mites, but only when the host exhibits a physio-energetical deficit. The adults of *S. cerambycina* live in the nests of the host, utilizing pollen and pollen paste stored by adult bees as their food source. They can cause only a minimal percentage of mortality in nests (Vicidomini 1996).

On November 11th, 2023, a heavily infested female specimen of the violet carpenter bee, *Xylocopa violacea* (Linnaeus, 1758), was discovered in a private garden in Vrčin (Grocka Municipality, Belgrade, Serbia) at coordinates 44.676586; 20.607959. The specimen was found on the ground, moving slowly but it was unable to fly. The approximate daytime temperature in the same garden was around 15°C. The specimen was densely covered with deutonymphs, particularly on the ventral side of the head and basal abdominal tergites, both ventrally and dorsally on the propodeum and thorax. Smaller numbers of mites were also present on the legs and on the surface of the wings.

Upon collection, the *X. violacea* specimen was initially placed in a plastic tube without fixative and stored at room temperature (~20°C). One day later, the specimen died, and the majority of mites began to leave the body surface of the bee, climbing up the inside of the plastic tube. Subsequently, the mites were fixed along with their host in 70% ethanol. The mite specimens were then utilized for the preparation of microscope slides, with glycerol serving as the medium for slide preparation. The photographs were taken using a Leica DMLB light microscope (Leica Microsystems) equipped with Leica DFC295 camera. The identification of *Sennertia* deutonymphs was performed using the keys, illustrations and descriptions provided in Fain (1981) and Klimov & OConnor (2008). The photographed specimens were presented on Figure 1.

The morphology of the collected specimens perfectly matches the descriptions, illustrations, and keys provided in Fain (1981) and Klimov & O'Connor (2008). The body length of specimens from Serbia ranged from 243 to 284 µm, falling within the known range of 243 to 380 µm documented in Fain (1981). *Xylocopa* bees from the *violacea*-group are recognized hosts of *S. cerambycina* (Fain 1981), as observed in the Serbian specimens where mites were discovered on the body of *X. violacea*.

Further detailed research is necessary to assess the impact of *S. cerambycina* on *X. violacea* bees in Serbia. Vicidomini (1996) discovered that even when the majority of *Xylocopa* females are infested, it does not significantly affect the bee's performance. Despite the lack of faunistic data, we assume that the territory of Serbia corresponds to the native range of *S. cerambycina*. Therefore, the presence of this mite species may not pose a threat to populations of *X. violacea*. Additional studies are needed to better understand the distribution and dynamics of *S. cerambycina* populations in Serbia.

The chaetodactylid fauna in Serbia is largely understudied. The only species mentioned so far is *Chaetodactylus osmiae* (Dufour, 1839), known as a cleptoparasite of *Osmia cornuta* (Latreille, 1805), and *O. rufa* (Linnaeus, 1758) (Stanisavljević et

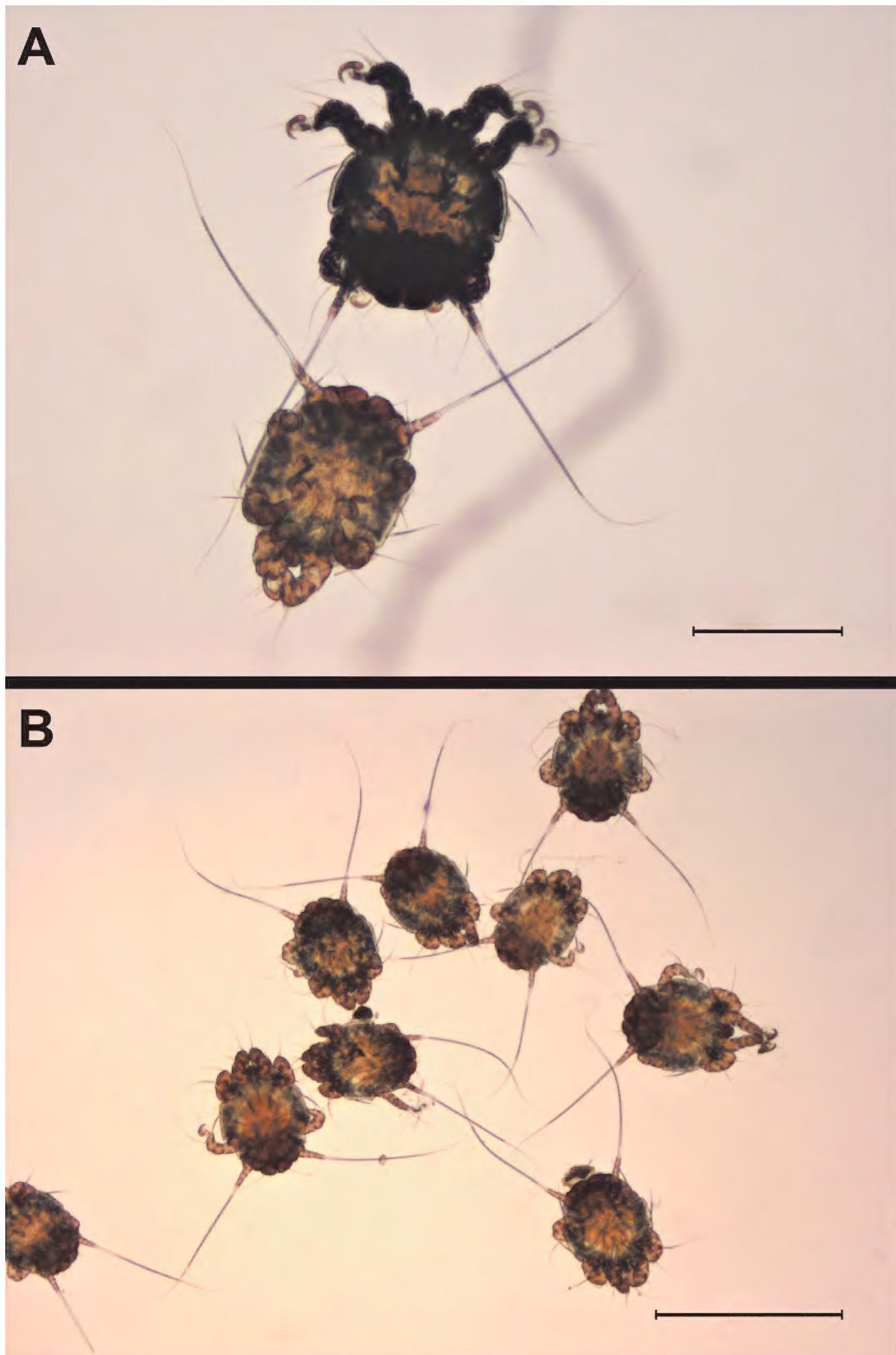


Figure 1. *Sennertia cerambycina* (deutonymph) from a violet carpenter bee *Xylocopa violacea*: A Upper specimen – dorsal view, lower specimen – ventral view; B Several deutonymphs, dorsal view. Scale bars: A = 200 μm ; B = 500 μm .

al. 1997). The species *Sennertia cerambycina* is recorded in Serbia for the first time, marking the initial record of its genus within the territory of Serbia.

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